



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

reducible for all finite values of p and r . Let $p=5, r=5$. Then, ignoring constant factor 5, $y^5 + 5y^3 + 5y + 5$ is reducible. But this is irreducible by the well known theorem of Eisenstein (Weber, l. c., p. 702).

The irreducibility may also be proved by setting $p=0, r=2$, whence the function $y^5 + 2$, which is irreducible by the theorem in Dickson's *Theory of Algebraic Equations*, p. 77, §90.

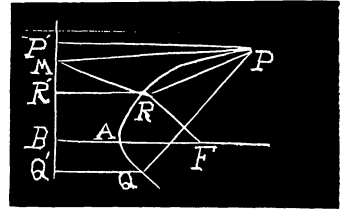
—
GEOMETRY.
—

332. Proposed by DAVID F. KELLEY, New York, N. Y.

To find the area of a parabolic sector, by a hitherto unpublished method.

Solution by the PROPOSER.

Let a secant meet a parabola in the points P and Q . Join the points P and Q to F which is the focus of the parabola. Let fall perpendiculars from P and Q on the directrix, BC , meeting it in the points P' and Q' , respectively. Let R be any other point on the curve between P and Q . Join P and R , and let fall RR' perpendicular to directrix BC , and meeting it in the point R' . Bisect $P'R'$ in M , and join M and R , and M and P . By a well known geometrical theorem, area of $\triangle PMR = \frac{1}{2}$ quadrilateral $PP'R'R$. Let R' move indefinitely near to P' , then, in the limit, $MR = R'R = FR$, and $NP = P'P = FP$. Therefore, in the limit, $\triangle PRF = \triangle PMR = \frac{1}{2}$ quadrilateral $PP'R'R$. Hence, it readily follows that space $FPRAQ = \frac{1}{2}$ space $PRAQQ'P'$. Hence, if $O = \text{space } PRAQQ'P'$, and $I = \text{space } PRAQ$, and $\Delta' = \text{area } \triangle FPQ$, and $k = \text{area of quadrilateral } PQQ'P'$, we have the following two equations connecting O and I :



$$\Delta' + I = \frac{1}{2}O, \quad O + I = k.$$

In particular, when PQ is perpendicular to AB , if x and y be coordinates of P , we have $(a-x)y + I = \frac{1}{2}O$. $I + O = 2(a+x)y$, and solving for I we get $I = 4xy/3$.

Again, since, in the limit, $\triangle FPR = \triangle MPR$, it follows that if perpendiculars be let fall from P' and F on the tangent to the parabola at P , then these perpendiculars are equal, and hence it is readily seen since $FP = PP'$ that the line joining F and P is bisected by the tangent at P , and is at right angles to it.

Also solved by G. B. M. Zerr, and H. V. Spunar.